

AD-A040 753

AIR FORCE HUMAN RESOURCES LAB BROOKS AFB TEX
PROJECT CONSTANT GROWTH: PILOT ATTITUDES.(U)
APR 77 J E KANTOR, B E NOBLE, G B REID
AFHRL-TR-77-12

F/G 5/9

UNCLASSIFIED

NL

1 OF 1
AD
A040753



END
DATE
FILMED
7-77

AIR FORCE



AD A 040 753

HUMAN RESOURCES

**PROJECT CONSTANT GROWTH:
PILOT ATTITUDES**

By

Jeffrey E. Kantor
Bart E. Noble, 1st Lt, USAF

PERSONNEL RESEARCH DIVISION
Lackland Air Force Base, Texas 78236

Gary B. Reid

FLYING TRAINING DIVISION
Williams Air Force Base, Arizona 85224

April 1977
Final Report for Period October 1975 - July 1976

Approved for public release; distribution unlimited.

DDC

JUN 21 1977

C

LABORATORY

AD No.

DDC FILE COPY

**AIR FORCE SYSTEMS COMMAND
BROOKS AIR FORCE BASE, TEXAS 78235**

NOTICE

When US Government drawings, specifications, or other data are used for any purpose other than a definitely related Government procurement operation, the Government thereby incurs no responsibility nor any obligation whatsoever, and the fact that the Government may have formulated, furnished, or in any way supplied the said drawings, specifications, or other data is not to be regarded by implication or otherwise, as in any manner licensing the holder or any other person or corporation, or conveying any rights or permission to manufacture, use, or sell any patented invention that may in any way be related thereto.

This final report was submitted by Personnel Research Division, Air Force Human Resources Laboratory, Lackland Air Force Base, Texas 78236, under project USAS, with HQ Air Force Human Resources Laboratory (AFSC), Brooks Air Force Base, Texas 78235.

This report has been reviewed and cleared for open publication and/or public release by the appropriate Office of Information (OI) in accordance with AFR 190-17 and DoDD 5230.9. There is no objection to unlimited distribution of this report to the public at large, or by DDC to the National Technical Information Service (NTIS).

This technical report has been reviewed and is approved for publication.

LELAND D. BROKAW, Technical Director
Personnel Research Division

DAN D. FULGHAM, Colonel, USAF
Commander

ADDITIONAL FOR	Write Section	<input checked="" type="checkbox"/>
	Diff. Section	<input type="checkbox"/>
NTIS		
DDC		
UNANNOUNCED		
JUSTIFICATION		
BY	DISTRIBUTION/AVAILABILITY CODES	
Dist.	A-1, A-2, and/or SPECIAL	
A		

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE (When Data Entered)

REPORT DOCUMENTATION PAGE		READ INSTRUCTIONS BEFORE COMPLETING FORM
1. REPORT NUMBER AFHRL-TR-77-12	2. GOVT ACCESSION NO.	3. RECIPIENT'S CATALOG NUMBER
4. TITLE (and Subtitle) PROJECT CONSTANT GROWTH: PILOT ATTITUDES	5. TYPE OF REPORT & PERIOD COVERED Final rept. Oct 1975 - July 1976	6. PERFORMING ORG. REPORT NUMBER
7. AUTHOR(s) Jeffrey E. Kantor Bart E. Noble Gary B. Reid	8. CONTRACT OR GRANT NUMBER(s)	
9. PERFORMING ORGANIZATION NAME AND ADDRESS Personnel Research Division (AFHRL) Lackland Air Force Base, Texas 78236 Flying Training Division (AFHRL) Williams Air Force Base, Arizona 85224	10. PROGRAM ELEMENT, PROJECT, TASK AREA & WORK UNIT NUMBERS 62205F USAS4000	
11. CONTROLLING OFFICE NAME AND ADDRESS HQ Air Force Human Resources Laboratory (AFSC) Brooks Air Force Base, Texas 78235	12. REPORT DATE April 1977	13. NUMBER OF PAGES 22
14. MONITORING AGENCY NAME & ADDRESS (if different from Controlling Office) 1224p.	15. SECURITY CLASS. (of this report) Unclassified	15a. DECLASSIFICATION/DOWNGRADING SCHEDULE
16. DISTRIBUTION STATEMENT (of this Report) Approved for public release; distribution unlimited.		
17. DISTRIBUTION STATEMENT (of the abstract entered in Block 20, if different from Report)		
18. SUPPLEMENTARY NOTES		
19. KEY WORDS (Continue on reverse side if necessary and identify by block number) conservation of resources constant growth flying training low-cost aircraft augmentation pilot attitudes positive and negative transfer reduction in flight time unit equipment (UE) proficiency		
20. ABSTRACT (Continue on reverse side if necessary and identify by block number) Recent cutbacks in military resource allocations have resulted in decreased unit equipment (UE) flying time. In order to counteract any resultant decrement in UE proficiency, it has been suggested that small, low cost aircraft (LCA) be used to augment simulator and UE time. Project Constant Growth was conducted to assess the feasibility of the LCA concept. Selected pilots supplemented their UE time with additional time in LCAs. Based on pilot attitudes, it would appear that when sufficient UE flight time is available, additional sorties flown in supplementary, or non-UE aircraft, do not necessarily represent a worthwhile training aid. Any positive aspects of such a program could possibly be negated by the detrimental effects perceived in UE operational procedures proficiency. However, where UE flight time has been substantially reduced, LCA sorties probably do represent a useful method of		

DDC
RECEIVED
JUN 21 1977
C

404 415

(cont on p 1473B) 4B

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

Item 20 Continued: for P1473A)

maintaining some pilot skills. If the maximum positive results are to be obtained, either the LCA or its mission capability should duplicate that of its UE counterpart to the greatest possible extent.

A

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE(When Data Entered)

PREFACE

This research was requested by Hq USAF under project USAS 4000, Constant Growth. Research was performed by the Personnel Research Division and the Flying Training Division, Air Force Human Resources Laboratory.

The authors wish to express their appreciation to the supervisory staffs and participant pilots of the following organizations for their support and cooperation in this project:

33d TFW, Eglin Air Force Base, Florida
27th TFW, Cannon Air Force Base, New Mexico
60th MAW, Travis Air Force Base, California

TABLE OF CONTENTS

I.	Introduction	Page 5
II.	Method	5
	Sample Population	5
	Survey Construction	6
	Procedure	6
III.	Results and Discussion	6
IV.	Recommendations	15
Appendix A: Low-Cost Aircraft Augmentation Test Program: Pilot Attitude Survey		17

LIST OF TABLES

Table		Page
1	Low-Cost Aircraft Augmentation Test Program: Pilot Attitude Survey – Total Group Responses	7
2	Low-Cost Aircraft Augmentation Test Program: Pilot Attitude Survey – Subgroup Responses	11

PROJECT CONSTANT GROWTH: PILOT ATTITUDES

I. INTRODUCTION

Continuing inflation of equipment and fuel costs, coupled with cutbacks in military financial and resource allocations, have recently directed Air Force policy towards conservation by decreasing unit equipment (UE) flying in operational squadrons. Aircraft simulator usage has concomitantly increased, and, although simulators can be successfully utilized to develop and maintain many skills required of Air Force flight crews, there has been some concern that certain pilot skills cannot be trained or maintained within this environment. It is possible that a general decrement in those abilities often termed "airmanship" and a specific decrement in UE proficiency may result from the reduction in UE flight time.

Unpublished research conducted by C. J. Searock of Air Staff in 1975 suggests that small, low-cost aircraft (LCA) possessing night, instrument, and aerobatic capabilities might be used to augment simulator and UE time to provide for the development and maintenance of airmanship and UE proficiency and still meet the goals of Air Force policy. To evaluate the potential of the LCA concept, a low-cost aircraft augmentation test program (called Project Constant Growth) was conducted. As originally envisaged, the test program would be a cooperative effort among the Strategic Air Command (SAC), Military Airlift Command (MAC), Tactical Air Command (TAC), Air Training Command (ATC), and Air Force Systems Command (AFSC). The Air Force Human Resources Laboratory (AFHRL) from AFSC would serve as an evaluative agency for the program, while pilot personnel from the other commands would directly participate in the test. For a period of one year, selected pilot personnel would supplement their UE flying time with sorties flown in ATC T-37/T-38 aircraft. All sorties would be flown with ATC instructor pilots having aircraft command and procedures responsibilities, and all missions would be flown within the performance/maneuvers envelope of the ATC undergraduate pilot training (UPT) syllabus. However, because of specific major command and operational unit concerns, adherence to the

original experimental design could not be maintained. For example, within the SAC environment, major reductions in UE flight time led to a quick and positive acceptance of the LCA program as a means of maintaining constant flight experience. For practical purposes, the test program had become operational, and, therefore, the requirement for evaluation within that command was withdrawn. The test program was continued within the other commands; however, due to fluctuations in operational needs, occasional scheduling difficulties, and other minor problems, total program stabilization was never achieved. These minor problems appear to represent the type of obstacles expected when any supplementary training program, such as the LCA program, is subject to restriction by more critical operational needs. Therefore, it is assumed that Project Constant Growth accurately reflected the impact of an operational LCA program.

One aspect of the LCA test program of interest to the Air Force was the attitudinal response of participant pilots to the LCA concept in general, and to the test program in particular. The purpose of this study was to assess whether a decrease in UE flying time was perceived by participants as impacting on UE proficiency, and whether supplementary flying time in an LCA could prove beneficial to maintaining pilot skills. Also considered was whether positive or negative transfer (i.e., whether experience in one type aircraft would help or hinder performance in another type) could be expected and, finally, what characteristics would be most desirable in an "ideal low-cost aircraft." To gather information relevant to these issues, a "Low-Cost Aircraft Augmentation Test Program: Pilot Attitude Survey" was constructed and administered to the participant pilots.

II. METHOD

Sample Population

The sample was comprised of 66 rated personnel representing different operational

assignments and major commands. From Travis Air Force Base, 27 MAC C-141 cargo transport co-pilots were selected. During the LCA test program, their UE flight time was augmented with additional time in the T-37 aircraft. Two test sites were selected to represent TAC — Eglin Air Force Base, where a group of 14 F-4E pilots supplemented their UE time with sorties flown in T-38 aircraft; and Cannon Air Force Base, where 25 F-111D pilots also flew additional hours in the T-38. The Travis, Eglin, and Cannon subgroups provided a total of 66.

Survey Construction

"The Low-Cost Aircraft Augmentation Test Program: Pilot Attitude Survey" was constructed by AFHRL to assess participant pilot attitudinal response to the LCA concept in general and to the LCA test program in particular. During construction, the following major areas of concern were delineated:

1. What, if any, was the effect of a reduction in UE flying time,
2. What would be the most beneficial method of countering any adverse effects (if any were found),
3. Could the LCA concept prove beneficial in maintaining certain pilot skills,
4. What were the positive and negative aspects of the LCA test program,
5. What specific effect did various aspects of the LCA test program have on UE performance, and
6. What characteristics would be desirable in an "ideal LCA."

Items were constructed to obtain information relevant to these issues. Because of the small sample size, several open-ended options were made available to allow individualized responding. A copy of the final instrument is presented in Appendix A. In compliance with a request from Hq TAC, items 8 and 10 were deleted from the survey when administered to participants from TAC.

Procedure

At the conclusion of the LCA test period, AFHRL personnel traveled to test sites to conduct

the survey administration. Testing was conducted in small groups requiring 20 to 30 minutes per group. A short verbal introduction describing AFHRL involvement in the program was followed by the administration of the survey. Overall, there appeared to be a substantial degree of squadron involvement in the program at both the operational and supervisory levels.

Scoring and tabulation of the 66 subjects' responses were performed manually. Distributional analyses were made based on the percentage distributions of the response alternatives. To allow for more meaningful comparisons, raw data responses for items 16 through 33 were collapsed into the following categories:

1. *Beneficial*: including raw data responses A (Very Beneficial) and B (Beneficial),
2. *No Impact*: including raw data responses C (No Impact),
3. *Detrimental*: including raw data responses D (Detrimental) and E (Very Detrimental), and
4. *Not applicable*: including raw data responses F (Not Applicable).

III. RESULTS AND DISCUSSION

The total number of subjects responding to each item and the percentages of that number selecting each item option are presented in Table 1. From items 1 and 2, it appears that the majority of the participants have experienced a reduction in UE flight time in the last two years, which they perceive as having some negative impact on their UE proficiency.

Considering items 3 and 4, although the vast majority of participants understood the rationale behind the LCA concept, there was no clear opinion expressed as to whether or not LCA flight time could help maintain UE proficiency. However, on item 5, the majority indicated that, if further reductions in UE flight time were mandated, either LCA flight time or a combination of LCA and simulator time would best help maintain UE proficiency. Eighteen percent of the respondents to item 5 wrote in a personal response; typically a statement to the effect that any further cutbacks in UE flight time might

**Table 1. Low-Cost Aircraft Augmentation Test Program:
Pilot Attitude Survey – Total Group Responses**

Survey Items	N	Percentage of Subjects
1. Has your unit equipment (UE) flight time been reduced during the last two years?		
A. Yes, by a considerable amount	57	46
B. Yes, by a small amount		46
C. No		8
2. If your UE flight time has been reduced, do you feel this has had any impact on your proficiency in the UE?		
A. Yes, a considerable negative impact	59	36
B. Yes, a small negative impact		46
C. No noticeable impact		7
D. Yes, a positive impact		0
E. My UE flight time has not been reduced		11
3. The rationale behind the LCA Program is to help pilots maintain their UE flight proficiency by supplementing UE flight time with time in low-cost aircraft. Was this rationale explained to you?		
A. Yes	66	97
B. No		3
4. Do you think that flight time in a low-cost aircraft can help you maintain your UE flight proficiency?		
A. Yes	66	32
B. Unsure		32
C. No		36
5. If resource and financial cutbacks (further) restrict UE flight time, which alternative would best help you maintain your UE flight proficiency?		
A. Supplementary low-cost aircraft flight time	66	27
B. Additional UE simulator time		7
C. A combination of low-cost aircraft flight time and UE simulator time		44
D. No additional training would be necessary		1
E. Other		21
6. Has your participation in the LCA Test Program had any impact on your morale?		
A. Yes, a positive effect	66	41
B. Yes, a negative effect		38
C. No		20

Table 1 (Continued)

Survey Items	N	Percentage of Subjects
7. Has your participation in the LCA Test Program had any impact on your career?		
A. Yes, a positive effect	65	11
B. Yes, a negative effect		9
C. No		80
8. Has the LCA Program enabled you to concentrate on areas of weakness?		
A. Yes	27	30
B. No		67
C. Unsure		3
9. Have the positive aspects of the program outweighed the negative aspects?		
A. Yes	65	55
B. No		45
10. Have your overall pilot skills increased because of the LCA Program?		
A. Yes	27	67
B. No		33
11. Do you think the LCA Program would benefit other pilots?		
A. Yes	64	82
B. No		12
C. Unsure		6
12. Was the LCA Program what you expected?		
A. Yes	66	32
B. No		67
13. Would you continue to participate in the LCA Program on a volunteer basis?		
A. Yes	64	59
B. No		39
C. Unsure		2
14. Which of the following is your UE aircraft?		
A. F-4E	65	20
B. F-111D		38
C. C-141		42
D. B-52		0
E. KC-135		0

Table 1 (Continued)

Survey Items	N	Percentage of Subjects
15. Which additional aircraft did you fly as part of the LCA Program?		
A. T-37	65	41
B. T-38		59

**Impact on UE Performance:
Various Aspects of LCA Test Program**

Survey Items	N	Percentage of Subjects			
		Beneficial %	No Impact %	Detrimental %	N/A %
16. Increased flying time	62	42	26	26	6
17. Opportunity to fly another aircraft	64	64	22	14	0
18. LCA transition/aerobatic missions	66	41	50	8	1
19. LCA two ship formation missions	64	36	22	6	36
20. LCA four ship formation missions	65	30	23	8	39
21. LCA cross-country missions	65	55	28	2	15
22. LCA instrument missions	62	60	26	8	6
23. Decreased "between flight time"	65	23	54	18	5
24. Flight without command responsibilities	65	3	48	43	6
25. Opportunity to practice tasks not possible in UE	65	45	35	9	11

Impact on Specific Aspects of UE Performance

26. UE instrument flying	66	45	35	9	11
27. UE weapons delivery	66	2	50	9	39
28. UE operating procedures proficiency	65	3	46	49	2
29. UE formation flying	58	33	19	10	38
30. UE aircraft handling ability	65	17	48	35	0
31. Crew coordination in the UE	63	10	65	25	0
32. Ability to stay ahead of UE	65	18	65	17	0
33. Your overall performance in the UE	65	29	42	29	0

Characteristics of an Ideal LCA

	Percentage of Subjects Selecting Each Option as Being Highly Desirable
Similar to UE in size	8
Similar to UE in flight performance	15
Similar to UE in cockpit configuration	13
Similar to UE in instrumentation	15
Simple to fly	9
High degree of maneuverability	11
Low operational cost	11
High degree of responsiveness to controls	7
Other	9

seriously decrease UE performance below acceptable limits.

Responses to items 6 through 13 appear to indicate a mixed, perhaps slightly positive attitude towards the LCA test program. In particular, the LCA program appears to have had no significant effect on either the morale or careers of the participants, and less than one-third of the participants felt that the LCA program enabled them to concentrate on areas of weakness (though, again, it should be noted that items 8 and 10 were administered only to subjects in the Travis group). However, slightly over half of the participants saw the program's positive aspects as outweighing the negative aspects, over two-thirds reported that their pilot skills had increased because of the program (item 10), and a large majority reported that the program would be of benefit to other pilots. Additionally, the majority of participants responded that they would volunteer to continue participation in the program. It is interesting that two out of every three reported that the LCA program was not what they had expected (item 12). This overall pattern of responses would appear to imply that the LCA concept was considered potentially beneficial, but that the LCA test program did not fit the particular needs of the participants.

Items 14 and 15 show the percentages of subjects flying each UE and LCA. For items 16 through 25, the subjects were asked to describe the impact of various aspects of the LCA program on their UE proficiency. Responses to these items can be used to indicate the pilot's opinion as to which aspects of the test program were either beneficial or detrimental. The majority of the respondents indicated that the beneficial aspects of the program were: the opportunity to fly another aircraft (item 17), LCA instrument flights (item 22), and LCA cross-country flights (item 21). A substantial number of respondents indicated that "flight without command responsibilities" (item 24) was detrimental.

For items 26 through 33, the subjects were asked to describe the impact of the LCA program on particular aspects of their UE performance. Responses to these items can be used to indicate the pilot's perception of areas of positive and negative transfer. While a substantial percentage reported that the LCA program was beneficial to

the UE instrument flying (item 26), in contrast, a substantial percentage reported that they felt that the LCA program was detrimental to their UE operating procedures proficiency (item 28). Additionally, in evaluating the overall impact of the LCA program (item 33), the greatest percentage (42%) of the respondents indicated that the program had no impact, while equal percentages of subjects (29%) reported either beneficial or detrimental effects. This would seem to indicate that the participants felt that the test program had limited usefulness to the participants, and that negative transfer on UE operating procedures proficiency might prove to be a potentially serious by-product of the program.

On the last section of items, which describe potential characteristics of an LCA, the data are presented in terms of the percentages of subjects who selected each option as an important characteristic of the ideal LCA. These responses appear to indicate the opinion that the ideal LCA would share with the operational UE aircraft identical or nearly identical flight performance, cockpit configuration, and instrumentation. Of the 8.8 percent of the respondents who wrote a personal response, the majority could be typified as desiring an LCA which would have the capability to fly missions similar to the UE. There was also some criticism expressed concerning the restraints involved in flying within the UPT syllabus.

The responses of the Travis, Cannon, and Eglin subgroups are presented in Table 2. The response pattern of the Travis group appears quite similar to the overall pattern, with the exception that the majority of the Travis respondents indicated that they felt that the LCA program had a detrimental effect on their UE aircraft handling ability (item 30). This might result from a greater disparity between control input and response between C-141 and T-37 aircraft than between either F-4E or F-111D and T-38 aircraft. The Travis participants appeared to perceive an area of negative transfer of potentially serious proportions, increasing in seriousness as the dissimilarity between UE and LCA aircraft increases.

The responses of the Cannon participants are also quite similar to the overall pattern except for the indication that LCA two- and four-ship formations (items 19 and 20) were particularly

Table 2. Low-Cost Aircraft Augmentation Test Program:
Pilot Attitude Survey - Subgroup Responses

Survey Items	Travis AFB Percentage of Subjects	Cannon AFB Percentage of Subjects	Eglin AFB Percentage of Subjects
1. Has your unit equipment (UE) flight time been reduced during the last two years?			
A. Yes, by a considerable amount	57	40	0
B. Yes, by a small amount	39	52	15
C. No	4	8	85
2. If your UE flight time has been reduced, do you feel this has had any impact on your proficiency in the UE?			
A. Yes, a considerable negative impact	43	32	11
B. Yes, a small negative impact	46	52	11
C. No noticeable impact	7	8	0
D. Yes, a positive impact	0	0	0
E. My UE flight time has not been reduced	4	8	78
3. The rationale behind the LCA Program is to help pilots maintain their UE flight proficiency by supplementing UE flight time with time in low-cost aircraft. Was this rationale explained to you?			
A. Yes	93	100	100
B. No	7	0	0
4. Do you think that flight time in a low-cost aircraft can help your maintain your UE flight proficiency?			
A. Yes	36	40	8
B. Unsure	39	36	8
C. No	25	24	84
5. If resource and financial cutbacks (further) restrict UE flight time, which alternative would best help you maintain your UE flight proficiency?			
A. Supplementary low-cost aircraft flight time	4	46	38
B. Additional UE simulator time	7	8	6
C. A combination of low-cost aircraft flight time and UE simulator time	79	31	0
D. No additional training would be necessary	0	0	6
E. Other	10	15	50

Table 2 (Continued)

Survey Items	Travis AFB Percentage of Subjects	Cannon AFB Percentage of Subjects	Eglin AFB Percentage of Subjects
6. Has your participation in the LCA Test Program had any impact on your morale?			
A. Yes, a positive effect	51	40	23
B. Yes, a negative effect	37	36	46
C. No	12	24	31
7. Has your participation in the LCA Test Program had any impact on your career?			
A. Yes, a positive effect	19	8	0
B. Yes, a negative effect	11	12	0
C. No	70	80	100
8. Has the LCA Program enabled you to concentrate on areas of weakness?			
A. Yes	30	0	0
B. No	67	0	0
C. Unsure	3	0	0
9. Have the positive aspects of the program outweighed the negative aspects?			
A. Yes	70	48	38
B. No	30	52	62
10. Have your overall pilot skills increased because of the LCA program?			
A. Yes	67	0	0
B. No	33	0	0
11. Do you think the LCA program would benefit other pilots?			
A. Yes	75	88	83
B. No	11	12	17
C. Unsure	14	0	0
12. Was the LCA program what you expected?			
A. Yes	36	20	46
B. No	64	80	54

Table 2 (Continued)

Survey Items	Travis AFB Percentage of Subjects	Cannon AFB Percentage of Subjects	Eglin AFB Percentage of Subjects
13. Would you continue to participate in the LCA program on a volunteer basis?			
A. Yes	71	60	23
B. No	25	32	77
C. No answer	4	8	0
14. Which of the following is your UE aircraft?			
A. F4E	0	0	100
B. F-111D	0	100	0
C. C-141	100	0	0
D. B-52	0	0	0
E. KC-135	0	0	0
15. Which additional aircraft did you fly as part of the LCA program?			
A. T-37	100	0	0
B. T-38	0	100	100

Impact on UE Performance: Various Aspects of LCA Program

Survey Items	Travis AFB				Cannon AFB				Eglin AFB			
	Beneficial %	No Impact %	Detrimental %	N/A %	Beneficial %	No Impact %	Detrimental %	N/A %	Beneficial %	No Impact %	Detrimental %	N/A %
16. Increased flying time	22	15	48	15	48	44	8	0	62	31	7	0
17. Opportunity to fly another aircraft	70	19	11	0	60	24	16	0	58	25	17	0
18. LCA transition/aerobatic missions	48	44	4	4	42	50	8	0	23	62	15	0
19. LCA two ship formation missions	0	15	0	85	64	20	12	4	54	38	8	0
20. LCA four ship formation missions	0	15	0	85	56	20	16	8	46	46	8	0
21. LCA cross-country missions	85	15	0	0	32	28	4	36	38	54	0	8
22. LCA instrument missions	85	15	0	0	24	44	16	16	61	31	8	0
23. Decreased "between flight time"	11	74	11	4	44	48	8	0	8	23	46	23
24. Flight without command responsibilities	4	59	30	7	0	36	60	4	8	46	38	8
25. Opportunity to practice tasks not possible in UE	52	33	7	8	56	28	8	8	8	54	15	23
26. UE instrument flying	44	33	22	0	24	60	16	0	43	50	7	0
27. UE weapons delivery	0	19	7	74	4	72	16	8	0	83	0	17
28. UE operating procedures proficiency	0	37	59	4	8	44	48	0	0	69	31	0
29. UE formation flying	0	14	4	82	56	28	16	0	38	54	8	0
30. UE aircraft handling ability	15	33	52	0	28	36	36	0	0	100	0	0
31. Crew coordination in the UE	15	74	11	0	8	50	42	0	0	69	23	8
32. Ability to stay ahead of UE	22	48	30	0	24	68	8	0	0	92	8	0
33. Your overall performance in the UE	41	18	41	0	24	52	24	0	15	69	16	0

Table 2 (Continued)

	Travis AFB %	Cannon AFB %	Eglin AFB %
Characteristics of Ideal LCA			
Similar to UE in size	11	4	9
Similar to UE in flight performance	15	17	13
Similar to UE in cockpit configuration	16	11	12
Similar to UE in instrumentation	16	16	13
Simple to fly	10	9	9
High degree of maneuverability	10	12	12
Low operational cost	11	14	10
High degree of responsiveness to controls	7	7	9
Other — Similar mission, longer range, command experience, same procedures, cockpit comfort, hydraulic similarities, acrobatic capabilities, yoke similarity, instrument similarities.	5		
Other — Similar to UE mission profile i.e., low level, bombing delivery		9	
— Cross-country		1	
— Carry crew to build coordination		1	
Other — Same mission profile as UE, i.e., weapons delivery			11
— Maintenance free			1
— More maneuverability			1

beneficial. The responses of the Eglin group appear to be the most negative towards both the LCA concept and the test program (e.g., items 4, 9, and 13). This group also showed the least reduction in UE flight time, and, as an operational squadron, were flying at close to the maximum possible extent. According to the data, when UE flight time is readily available, additional flight duties in a supplementary aircraft would seem undesirable.

Overall, the following impressions result from the survey response. Reductions in UE flight time can result in a perceived decrease in UE proficiency. It may be possible that additional supplementary flight time in a low cost aircraft might help maintain certain pilot skills. However, within the confines of this test program, limited benefits were perceived by participants, and there were indications of potentially serious problems involving negative transfer. It appears that some tailoring of the program should be undertaken to increase those sources of positive transfer and to

eliminate any areas of negative transfer. Two possible sources of remediation would be either the procurement of LCAs duplicating particular UE aircraft or, more reasonably, selection of an LCA which can be utilized to fly missions similar to those undertaken in the UE. For example, participants from cargo transport squadrons might concentrate primarily on cross-country and instrument flights, while participants from squadrons flying fighter-bomber aircraft might utilize the LCA for low-level navigation practice. Some attempt was made during Project Constant Growth to tailor the LCA flights to correspond to different UE missions; however, due to the maneuvers/performance limitations of the ATC UPT syllabus, this was not totally possible. A possibly beneficial extension of the program would include maneuvers outside the UPT syllabus. Due to the proficiency level of participant pilots, such restrictions may not be truly necessary.

In summary, the pilot attitudinal data appear to reflect that the low cost aircraft concept is potentially beneficial, but, that in the present test program form, it is of limited usefulness to the participants.

IV. RECOMMENDATIONS

Based on pilot attitudes, it would appear that when sufficient UE flight time is available, additional sorties flown in supplementary, or non-UE

aircraft, do not necessarily represent a worthwhile training aid. Any positive aspects of such a program could possibly be negated by the detrimental effects perceived in UE operational procedures proficiency. However, where UE flight time has been substantially reduced, LCA sorties probably do represent a useful method of maintaining some pilot skills. If the maximum positive results are to be obtained, then either the LCA or its mission capability should duplicate that of its UE counterpart to the greatest possible extent.

LOW-COST AIRCRAFT AUGMENTATION TEST PROGRAM PILOT ATTITUDE SURVEY

The following survey was designed to determine your opinion regarding the Low-Cost Aircraft (LCA) Test Program. Your answers will be a major consideration when selecting the aircraft, modification, and equipment for the program. The program is one of the most important to the Navy, and your response will be a major factor in the selection of the aircraft and equipment for the program.

1. The first question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

2. The second question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

3. The third question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

4. The fourth question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

APPENDIX A: LOW-COST AIRCRAFT AUGMENTATION TEST PROGRAM: PILOT ATTITUDE SURVEY

5. The fifth question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

6. The sixth question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

7. The seventh question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

8. The eighth question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

9. The ninth question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

10. The tenth question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

11. The eleventh question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

12. The twelfth question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

13. The thirteenth question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

14. The fourteenth question asks you to indicate the following degrees of interest in the program. Please check the appropriate response.

**LOW-COST AIRCRAFT AUGMENTATION TEST PROGRAM:
PILOT ATTITUDE SURVEY**

The following survey was designed to allow you to express your impressions regarding the Low-Cost Aircraft (LCA) Test Program. Pilot attitudes will be a major consideration when decisions are made about the worth, modification, and continuance of this program. Therefore, please be sure to give your honest response to the items below. Your replies will be kept in strict confidence and will in no way affect your service career.

In this first section, please answer the following questions by putting a check in the space to the left of the appropriate response.

1. Has your unit equipment (UE) flight time been reduced during the last two years?

☐ A. Yes, by a considerable amount
☐ B. Yes, by a small amount
☐ C. No
2. If your UE flight time has been reduced, do you feel this has had any impact on your proficiency in the UE?

☐ A. Yes, a considerable negative impact
☐ B. Yes, a small negative impact
☐ C. No noticeable impact
☐ D. Yes, a positive impact
☐ E. My UE flight time has not been reduced
3. The rationale behind the LCA Program is to help pilots maintain their UE flight proficiency by supplementing UE flight time with time in low-cost aircraft. Was this rationale explained to you?

☐ A. Yes
☐ B. No
4. Do you think that flight time in a low-cost aircraft can help you maintain your UE flight proficiency?

☐ A. Yes
☐ B. Unsure
☐ C. No
5. If resource and financial cutbacks (further) restrict UE flight time, which alternative would best help you maintain your UE flight proficiency?

☐ A. Supplementary low-cost aircraft flight time
☐ B. Additional UE simulator time
☐ C. A combination of low-cost aircraft flight time and UE simulator time
☐ D. No additional training would be necessary
☐ E. Other (Specify) _____

6. Has your participation in the LCA Test Program had any impact on your morale?

☐ A. Yes, a positive effect
☐ B. Yes, a negative effect
☐ C. No
7. Has your participation in the LCA Test Program had any impact on your career?

☐ A. Yes, a positive effect
☐ B. Yes, a negative effect
☐ C. No
8. Has the LCA Program enabled you to concentrate on areas of weakness?

☐ A. Yes
☐ B. No
☐ C. Unsure

9. Have the positive aspects of the program outweighed the negative aspects?

☐ A. Yes
☐ B. No

10. Have your overall pilot skills increased because of the LCA Program?

☐ A. Yes
☐ B. No

11. Do you think the LCA Program would benefit other pilots?

☐ A. Yes
☐ B. No

12. Was the LCA Program what you expected?

☐ A. Yes
☐ B. No

13. Would you continue to participate in the LCA Program on a volunteer basis?

☐ A. Yes
☐ B. No
☐ C. Unsure

14. Which of the following is your UE aircraft?

☐ A. F-4E
☐ B. F-111D
☐ C. C-141
☐ D. B-52
☐ E. KC-135

15. Which additional aircraft did you fly as part of the LCA Program?

☐ A. T-37
☐ B. T-38

In this section, select the most appropriate response from those listed below and place the letter representing that response in the space to the left of each item.

A. Very Beneficial
B. Beneficial
C. No Impact
D. Detrimental
E. Very Detrimental
F. Not Applicable

On these items, describe the impact on your UE proficiency resulting from these aspects of the LCA Test Program.

16. ☐ Increased flying time
17. ☐ Opportunity to fly another aircraft
18. ☐ LCA transition/aerobatic missions
19. ☐ LCA two ship formation missions
20. ☐ LCA four ship formation missions
21. ☐ LCA cross country missions
22. ☐ LCA instrument missions
23. ☐ Decreased "between flight time"
24. ☐ Flight without command responsibilities
25. ☐ Opportunity to practice tasks not possible in UE

On these items, describe the impact the LCA program has had on these aspects of your performance in the UE.

26. ☐ UE instrument flying
27. ☐ UE weapons delivery
28. ☐ UE operating procedures proficiency
29. ☐ UE formation flying
30. ☐ UE aircraft handling ability
31. ☐ Crew coordination in the UE
32. ☐ Ability to stay ahead of UE
33. ☐ Your overall performance in the UE

In this section, we would like your opinions as to what characteristics would be most important for the "Ideal Low-Cost Aircraft." Please rank from 1 (Most Important) to 5 (Least Important), the five characteristics you would want to have in the ideal LCA.

RANK

- _____ Similar to UE in size
- _____ Similar to UE in flight performance
- _____ Similar to UE in cockpit configuration
- _____ Similar to UE in instrumentation
- _____ Simple to fly
- _____ High degree of maneuverability
- _____ Low operational cost
- _____ High degree of responsiveness to controls
- _____ Other (Specify) _____
- _____ Other (Specify) _____
- _____ Other (Specify) _____

Finally, please make any additional comments you feel should be considered in evaluating the LCA Test Program.
